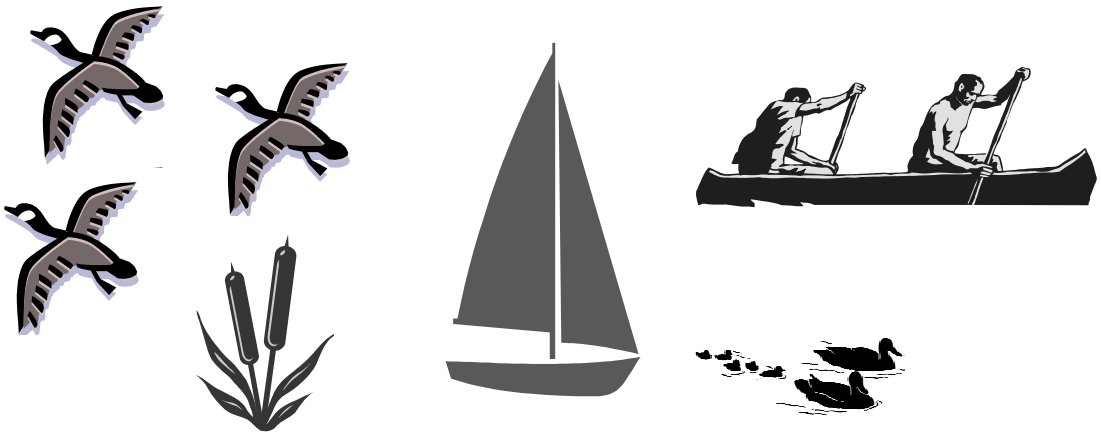
MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Nonpoint Source Management Plan
Volume II

The Nonpoint Program and the Massachusetts Watershed Initiative
1999 Update



EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
BOB DURAND, SECRETARY
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
LAUREN A. LISS, COMMISSIONER
BUREAU OF RESOURCE PROTECTION
GLENN HAAS, ACTING ASSISTANT COMMISSIONER
DIVISION OF WATERSHED MANAGEMENT
DAVID TERRY, ACTING DIRECTOR

NOTICE OF AVAILABILITY

LIMITED COPIES OF THIS REPORT ARE AVAILABLE AT NO COST BY WRITTEN REQUEST TO:

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATERSHED MANAGEMENT
627 MAIN STREET
WORCESTER, MA 01608

This report is also available from the Department of Environmental Protection, Division of Watershed Management's home page on the World Wide Web at:

http://www.state.ma.us/dep/brp/wm/wmpubs.htm

NOTE: For web publication, corrections to the printed version of this report are highlighted in purple.

Furthermore, at the time of first printing, eight (8) copies of each report published by this office are submitted to the State House in Boston; these copies are subsequently distributed as follows:
On shelf; retained at the State Library (two copies);
Microfilmed; retained at the State Library;
Delivered to the Boston Public Library at Copley Square;
Delivered to the Worcester Public Library;
Delivered to the Springfield Public Library;
Delivered to the University Library at Umass Amherst;
Delivered to the Library of Congress in Washington, D.C.

Moreover, this wide circulation is augmented by inter-library loans from the above-listed libraries. For example, a resident of Winchendon can apply at their local library for a loan of any DEP/Division of Watershed Management report from the Worcester Public Library.

A complete listing of reports published since 1963 is updated annually and printed in July. This report, entitled, "Publications of the Massachusetts Division of Watershed Management – Watershed Planning Program, 1963 – (current year)" is also available by writing to the DWM in Worcester.

DISCLAIMER

Reference to trade names, commercial products, manufacturers, or distributors in this report constitutes neither endorsement nor recommendation by the Department of Environmental Protection for use.

NONPOINT SOURCE MANAGEMENT PLAN – VOLUME II

THE NONPOINT SOURCE PROGRAM AND THE MASSACHUSETTS WATERSHED INITIATIVE

Researched and Compiled by:

Eben W. Chesebrough

Department of Environmental Protection
Bureau of Resource Protection

Report Number: MS-E-7

MASSACHUSETTS DEPARTMENTOF ENVIRONMENTAL PROTECTION
DIVISION OF WATERSHED MANAGEMENT
WORCESTER, MASSACHUSETTS

APRIL 2001

TABLE OF CONTENTS

MASSACHUSETTS NONPOINT SOURCE MANAGEMENT PLAN

UPDATE 1999-2000

EXECUTIVE SUMMARY

The Nonpoint Source Management Plan was originally developed by the Department of Environmental Protection in 1988 pursuant to Section 319 of the Clean Water Act (33 U.S.C.A., Sec. 1251 et. seq.). The current document (revised in 1994 and again in 1999) is a comprehensive update of the original plan. The updated Nonpoint Source Management Plan is presented in four volumes and what follows is an executive summary of the Management Plan in general and each volume in particular.

IN GENERAL

The Nonpoint Source Management Plan sets forth an integrated strategy and identifies programs to prevent, control and reduce pollution from nonpoint sources to protect and improve the quality of the waters of the Commonwealth. The Clean Water Act, Section 319, specifies the contents of the Management Plan to ensure that the plan realistically addresses all of the major categories of nonpoint source pollution in the state. It is important to understand that the plan is an implementation strategy for best management practices with attention given to funding sources and a milestone schedule.

The Massachusetts Nonpoint Source Program has developed as a dynamic and effective program characterized by the nine-key elements described in the "Nonpoint Source Program and Grants Guidance for Fiscal Year 1997 and Future Years" issued by EPA in May of 1996. The State program focuses on strong working partnerships and watershed-based solutions implemented through the Massachusetts Watershed Initiative.

Each year the Congress appropriates funds under Section 319 to assist the states in implementing their approved Nonpoint Source Management Plans. Only those implementation strategies contained in the Management Plan are eligible for federal funding. Implementation activities include regulatory enforcement, technical assistance, education, training, technology transfer and demonstration projects.

The current update of the Nonpoint Source Management Plan makes specific reference to the Coastal Nonpoint Pollution Plan mandated by Section 6217 of the Coastal Zone Reauthorization Act of 1990. This coastal plan was granted provisional approval in 1995 and has been adopted into the Section 319 Management Plan. The Coastal Plan strategies and enforcement policies will be implemented state-wide as appropriate within the context and schedule of the Watershed Initiative.

VOLUME I-STRATEGIC SUMMARY

This volume is a strategic summary of the 1999 updated Nonpoint Source Management Plan. It contains certain sections of the Management Plan that clearly focus on the core Nonpoint Source (NPS) Program and provides a strategic approach for the direction of the program for the foreseeable future. The Management Plan itself is contained in three volumes with over four hundred pages. This report distills much of the Management Plan into a more manageable format and keys into the strategic actions underway. It is hoped that the present document is both readable and usable for watershed teams, local governments, watershed associations, and other state/federal agencies that will be responsible for assisting in the critical nonpoint source implementation effort.

The sections of this summary report represent components of the overall state NPS Strategy as set forth in the NPS Management Plan, revised and upgraded in 1999 in conformance with EPA's Nine-Key Elements. The overall goal of the NPS strategy is to preserve and augment the water quality of the waters of the Commonwealth which are impaired or threatened by nonpoint source pollution.

This goal will be addressed through the various program components described in the NPS Management Plan and summarized in this report. These program components will:

1. Provide regional guidance and assistance to the watershed teams and public to:

   a. identify and prioritize NPS problems in each watershed,
   b. develop specific grant proposals for implementation projects, and
   c. target funding to these priorities to address and remediate NPS impacts to water quality.

2. Integrate NPS strategic actions into the Massachusetts Watershed Initiative (MWI) to achieve more targeted implementation.

3. Integrate Total Maximum Daily Load (TMDL) recommendations (which are mostly NPS BMPs) into the MWI to achieve effective implementation by the watershed teams and municipalities and thus attain water quality standards in the state's impaired waterbodies.

4. Identify short and long-term strategies for both the NPS Section 319 Program and the Coastal Section 6217 NPS Program and effectuate their implementation through specific segment-by-segment analysis and subsequent remediation by the watershed teams and DEP.

VOLUME II-NONPOINT SOURCE PROGRAM and the MASSACHUSETTS WATERSHED INITIATIVE

Volume II of the Nonpoint Source Management Plan sets forth a highly focused and structured nonpoint source strategy that is closely integrated into the Massachusetts Watershed Initiative. Each year a certain number of basins are scheduled so as to cover the entire state within five years.

Each year of the five year cycle focuses on a distinct set of activities with a common objective:

Year 1 - Outreach, education and information gathering
Year 2 - Water resource monitoring; outreach
Year 3 - Water resource assessment; outreach
Year 4 - Implementation of water quality corrective actions and BMPs; outreach
Year 5 - Continued implementation and evaluation; outreach

Volume I1 of the Nonpoint Source Management Plan describes this statewide watershed initiative and how the 305(b), 303(d), and TMDL process all fit within the five-year cycle.

VOLUME III-STATEWIDE PLAN AND GOALS

Volume III of the Nonpoint Source Management Plan is a technical update and revision of the original 1988 Management Plan. This third volume generally follows the original plan format and updates the state's nonpoint source related programs. Certain sections have been deleted, others added and still others amended to reflect programmatic changes and progress made by Massachusetts since the original plan was written in 1988.

As mentioned under Volume II, emphasis has been given to the emerging Coastal Nonpoint Pollution Plan authorized under Section 6217 of the Coastal Zone Reauthorization Act of 1990. The Coastal Plan has developed and will implement management measures to address nonpoint source categories of pollution common throughout coastal Massachusetts. It has been decided to apply the Coastal Plan's management measures state-wide. The Coastal Plan was essentially completed in 1995 and will be incorporated into the 319 Management Plan by way of addendum.

Volume III also stresses the watershed approach, the central theme of DEP's core Nonpoint Source Program as described in Volume II. The watershed approach is likewise a major tenet of the Clean Water Strategy which provides a conceptual framework for DEP's water resource programs.

Section VI of Volume III contains long-term strategies. Some of these long-term strategies are ongoing and some constitute new initiatives. It is felt that these strategies have high potential to prevent and abate nonpoint source pollution in Massachusetts. The long-term strategies are:

LONG-TERM STRATEGIES

A. Implement the Massachusetts Watershed Initiative

B. Title 5 Regulations For the Subsurface Disposal of Sanitary Sewage

C. Soil Erosion and Sedimentation Control Law

D. Stormwater Runoff Control
   1. Subdivision Control Law
   2. Chapter 90 Local Road Improvements
   3. State, County, Federal Roads
   4. Stormwater Management Policy Handbook

E. Public Water Supply - Wellhead Protection Program and Other Programs

F. Bay Programs
   1. Buzzards Bay and Mass Bays
   2. Waquoit Bay
   3. Narragansett Bay

G. Cape Cod Commission - Sole Source Aquifer Protection.

H. Rivers Protection Act of 1996.

I. Outreach and the Mega Manual.

J. Nutrient Loading Approach to Wastewater Permitting and Disposal.

K. Develop and Implement TMDLs.

L. Cooperate with Implementation of Section 6217 CZM Coastal Nonpoint Source Plan.

Volume III further describes how the original Nonpoint Source Advisory Committee has been replaced by functioning Watershed Teams. Each Watershed Team has many non-state representatives which act as individual watershed advisory committees. It is the watershed team which directs and prioritizes all of the basin activities within the context of the Watershed Initiative.

VOLUME IV-WATERSHED NONPOINT SOURCE ACTION STRATEGIES

The major purpose of the nonpoint source action strategies is to compile, segment by segment for each major watershed, the 303(d) impairments, other outstanding water quality issues, the data/information sources, and recommendations to address the water quality impairments.

The action strategies are designed to focus on the most pressing situations causing violations of the state's water quality standards based upon dependable and verifiable data sources. This volume of the NPS Management Plan will be updated, on the average, every two years.

The action strategies are meant to primarily assist the DEP regions and the EOEA watershed teams to focus their collective energies on priority water quality impairments. It is not intended to replace or compete in any way with the watershed team action plans.

The action strategies are also focused primarily on nonpoint source causes of the water quality impairments. These compilations are not intended to be encyclopedic regarding watershed water quality issues. The emphasis is upon 303(d) water quality impairments with recommendations of actions to address the situations.

The overall layout and format is intended to be brief and succinct with what we hope is just the essential information presented in an easy to read presentation. Several of the data sources listed are rather weighty volumes which may intimidate some of the more inveterate researchers. Thus the present effort to reduce a large amount of information down to some bare essential action recommendations. Any person interested in more detail is encouraged to consult any of the listed references (sources).

PREAMBLE

The NPS Management Plan is intended to be the major document which guides the Commonwealth in implementing its Nonpoint Source Program. The goal of the program is to preserve and augment the water quality of the waters of the Commonwealth which are impaired or threatened by nonpoint source pollution. The Management Plan describes the NPS Program components that the state intends to implement to attain that goal. When taken together, the program components are intended to produce a balanced state program. The program will strive to attain a balance by providing for the improvement of particular waterbodies' quality through the performance of watershed projects (or through focussing efforts in specific wellhead protection areas and other groundwater recharge areas) and the implementation and institutionalism of long-term statewide nonpoint source programs that encompass a broad range of activities (including non-regulatory and regulatory programs).

The Nonpoint Source Program has been fully integrated into the Massachusetts Watershed Initiative. In this way it has become a focused program pursued on a watershed basis. Additionally, each watershed can be subdivided into manageable sub-watersheds whose waterbodies are prioritized for nonpoint source purposes. Having organized the watersheds accordingly, each watershed team can then target high priority water resources within the selected sub-watersheds for implementation activities in a step-by-step process. This Management Plan establishes the process for determining the Commonwealth's priorities for nonpoint source pollution.
An important aspect of the Watershed Initiative is that over a five-year period the entire state is covered, basin by basin. This allows each basin to be re-visited every five years for review, evaluation and continuing implementation activity.
Another very important aspect of this approach is the integration of point and nonpoint source programs on an orderly, watershed by watershed basis. This method has the outstanding benefit of comprehensively managing each watershed for the control and prevention of all major sources of water pollution. The Total Maximum Daily Load (TMDL) process will be utilized, on a priority water resource basis (i.e., the 303(d) list of impaired waters), to allocate pollution loads between point and nonpoint sources. This enables each major source of water pollution to be put in proper perspective for corrective measures.

It should be noted that the concept of using the TMDL process to integrate point and nonpoint loads is a goal of the Management Plan which may take some time to implement with any degree of efficacy.

Finally, the Watershed Initiative firmly establishes state NPS strategies that have clearly defined roles, purposes and direction. An established milestone schedule of basins and an established process for developing watershed workplans will strengthen the program. With each year's experience the program can adjust so as to reduce redundancy and better focus on really important issues. The entire process holds great promise for the cause of clean water in Massachusetts. The potential for success is further strengthened because any person in any watershed may participate on a Watershed Team to bring into focus any concern they may have regarding water quality or water resources.

MASSACHUSETTS COASTAL NONPOINT POLLUTION CONTROL

Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990- (CZARA) requires that states with federally approved coastal zone management programs develop Coastal Nonpoint Pollution Control Programs to be approved by the Environmental Protection Agency (EPA) and National Oceanic and Atmospheric Administration (NOAA). This program brings together authorities and capabilities within state coastal zone management and water quality agencies to jointly address the problem of coastal nonpoint pollution.

In Massachusetts the Coastal Nonpoint Pollution Control Program will be an integral part of the overall state Nonpoint Source Management Plan. The coastal plan must comply with federal program guidance that employs an initial technology-based approach generally throughout the coastal management area, to be followed by a more stringent water-quality based approach, where necessary, to address known water quality problems. The management measures developed in the coastal plan will be implemented on a state-wide basis in Massachusetts except, of course, those management measures that are singularly applicable to coastal watersheds.

On February 19, 1998 President Clinton announced the Clean Water Action Plan to restore and protect America's waters. Specifically, the Clean Water Action Plan includes the following Key Action for the CZARA:

> KEY ACTION: NOAA and EPA will work with coastal states and territories to ensure that they have developed programs to reduce polluted runoff in coastal areas and that these programs are at least conditionally approved by June 1998 and that all programs are fully approved by December 1999, with appropriate state-enforceable policies and mechanisms.

In furtherance of the Clean Water Action Plan's goal of reducing polluted runoff in coastal areas, NOAA and EPA adopted the following final Administrative Changes relative to the 6217(g) program:

ADMINISTRATIVE CHANGES TO THE COASTAL NONPOINT PROGRAM

Targeting

- NOAA and EPA agree that states may focus resources on preventing and controlling significant impacts of nonpoint source pollution on living coastal resources and human health.

- Coordination and integration of coastal nonpoint programs with other programs and water quality initiatives, e.g., state §319 nonpoint source programs, the development of Total Maximum Daily Loads (TMDL) under Section 303(d) of the Clean Water Act, the Environmental Quality Incentives Program under the 1996 Farm Bill, National Estuary Programs, and State Watershed Plans, should be considered in establishing priorities and developing strategies to meet §6217 CZARA program requirements.

- In establishing priorities, states will address both pollution prevention and water quality improvement goals, including the protection of pristine areas and coastal waters that are threatened by reasonably foreseeable increases in pollution loadings from new or expanding sources. Targeting program implementation will involve a balance between the need to implement nonpoint source controls broadly and the need to address specific water quality problems for particular watersheds.

- NOAA and EPA do not expect states to implement management measures for nonpoint sources that do not, individually or cumulatively, have a significant impact on coastal waters. Subsequent to program approval, including conditional approval, NOAA and EPA will allow states to further exclude sources either by category, subcategory or management measure or on a geographic basis (e.g., a 6217 management area, watershed, county) where states can provide either existing or newly developed information (e.g., monitoring data) to

demonstrate that a source is not, and is not reasonably expected to, become significant, either individually or cumulatively.

- After NOAA and EPA, working with states, have applied the administrative changes to the program Findings that have been issued, states will determine program priorities, and communicate those priorities to NOAA and EPA by submitting a 15-year program strategy that briefly describes the State's overall approach and schedule to ensure implementation of the 6217(g) management measures and improve water quality within 15 years of the date of conditional approval. This means that all applicable 6217(g) management measures to protect and restore coastal waters will be implemented, though NOAA and EPA recognize that all water quality problems attributable to nonpoint sources, e.g., nitrate contamination of groundwater, may not be resolved within 15 years.

- In order to provide for further targeting of individual management measures, NOAA and EPA will re-examine state programs to determine where existing state thresholds for application of the management measures may be sufficient to protect and restore coastal waters.

Enforceable Policies and Mechanisms

- NOAA and EPA will approve those program elements for which states have proposed voluntary or incentive-based programs, backed by existing state enforcement authorities, if the following is provided:

    1. A legal opinion from the attorney general or an attorney representing the agency with jurisdiction for enforcement that such authorities can be used to prevent nonpoint pollution and require management measure implementation, as necessary;

    2. a description of the voluntary or incentive-based programs, including the methods for tracking and evaluating those programs, the states will use to encourage implementation of the management measures;

    3. a description of the mechanism or process that links the implementing agency with the enforcement agency and a commitment to use the existing enforcement authorities where necessary.

- NOAA and EPA will approve those program elements for which states have proposed the use of § 401 Clean Water Act (CWA) certifications and Coastal Zone Management Act (CZMA) consistency certifications to meet program requirements where states can demonstrate the following;

    1. The certifications, either alone or in concert with other programs, are sufficient to address the full range of applicable activities and sources of nonpoint pollution (e.g., marinas, hydromodification and wetlands) and geographic areas for which they are proposed;

    2. there is a back-up authority (e.g., water quality authority) that can be used, as described above, by the state to enforce conditions or revoke certification;

    3. the state has a monitoring system or other tracking methods by which to assess whether permit conditions have been met.

Timeframes

- Timeframes for conditional approval will remain the same as those specified in the March 16, 1995 Flexibility Guidance, e.g., up to five years after conditional approval to meet conditions, with an evaluation of progress after three years.

- Rather than the existing program schedule that calls for implementation of (g) management measures, monitoring, and implementation of additional management measures in succession, NOAA and EPA will support the establishment of an iterative process for implementing (g) management measures, assessing their effectiveness in achieving water quality goals and determining the need for additional management measures.

NOAA and EPA will continue to expect that management measures for new sources (e.g., new development) will be implemented as the new sources come online. NOAA and EPA expect that all individually and cumulatively significant nonpoint source categories and all watersheds within the §6217 management area will be addressed within 15 years.

Program Implementation/Evaluation

- Each state will develop a five-year implementation plan describing when, where, and how program implementation will occur, including mechanisms for tracking and monitoring implementation. The plan will contain interim milestones and benchmarks, including a time-frame, and be updated as necessary, but at least every five years. Achieving the milestones and benchmarks of these plans will serve as a basis for evaluating progress in achieving program implementation goals. The five-year implementation plan will be more specific than and nested within the longer term 15-year program strategy for achieving full implementation of the §6217 (g) management measures. The five-year implementation plan will be designed to ensure adequate progress in achieving the 15-year program strategy and should be integrated and consolidated with other federal and state water quality programs.

- The 15-year program strategy should include: a description of the means that the state will use to demonstrate progress in implementing the management measures; a basis for determining whether its program will succeed in ensuring implementation within the 15-year implementation period (e.g., implementation rates); and, a process whereby the state will determine the need to use a back-up authority and/or adopt additional enforceable policies and mechanisms to ensure implementation of the management measures within 15 years.

- At least every five years, NOAA and EPA will evaluate progress in achieving goals established through the five-year implementation plans and the 15-year program strategies, including the success of existing authorities, coupled with voluntary or incentive-based programs, in achieving management measure implementation.

- Where levels of implementation are less than needed to ensure implementation within 15 years of the date of conditional approval, the five-year implementation plan will outline steps the state will take to improve progress, including application of existing authorities or the development of new enforceable policies and mechanisms to achieve full implementation of the §6217(g) management measures. NOAA and EPA will work with the states to develop guidance for the evaluation process which clarifies the roles of the federal agencies and seeks, to the maximum extent possible, to avoid duplication and ensure coordination with other program implementation and review processes.

- For program implementation activities associated with §319 CWA or §306 and §309 CZMA grants, NOAA and EPA will evaluate progress through performance reports submitted for their respective grant activities.

Resources

- Working with the coastal states, the environmental community, effected interests, and others, NOAA and EPA are committed to finding sources of funding for continued development and implementation of the Coastal Nonpoint Program, Providing technical support and ensuring federal agency coordination.

- The availability of resources will necessitate the implementation of management measures incrementally.

INTRODUCTION

Nonpoint source pollution arises from the use of the land. In Massachusetts the single greatest authority with jurisdiction over the use of the land is local government. This authority is primarily exercised through zoning and permitting. Whether a parcel of land is used for farming, residential, commercial or industrial use, or preserved as open space, is determined at the local level. It is, therefore, the local government which has the authority and opportunity to implement best management practices (BMP's) to prevent and control nonpoint source pollution through the zoning and permitting process.

The Massachusetts Watershed Initiative acknowledges the importance of local control and the effectiveness of community-based environmental protection. The watershed approach is a coordinating framework for environmental management that focuses public and private sector efforts to address the highest priority water-related problems within sub-watersheds, considering both surface and groundwater flow. The Watershed Initiative gives each community a meaningful role in the decision making process to direct limited resources toward priority issues. This process has tremendous relevance in today's environment of heightened awareness for the very simple reason that people can personally relate to their own watershed and fully participate in the Watershed Team.

The Management Plan is oriented toward achieving effective results within the context of the Watershed Initiative. The Department of Environmental Protection is committed to a Nonpoint Source Program which is an integral part of the Watershed Initiative and the Clean Water Strategy. This commitment recognizes that clean water can be most easily achieved and maintained through a strategy which coordinates the point and nonpoint source programs on an organized basin-wide approach.

The first major element of the Clean Water Strategy states in pertinent part:

> "River basins are the basic planning unit for focussing and integrating water resource protection programs. To the maximum extent practical, the Bureau of Resource Protection's monitoring, permitting, compliance, enforcement and public outreach programs will be coordinated within river basins, which will be examined in depth every five years, in accordance with the renewal schedule of major withdrawal and discharge permits. In this way, water quality and water quantity issues can be simultaneously evaluated, cumulative impacts can be better addressed, a more informed public can participate in the information gathering and decision-making process, and program efficiencies and effectiveness can be realized by planning in advance the convergence of several related activities."

And, more specifically, the Clean Water Strategy emphasizes that:

> "Water resources should be managed with watersheds as the basic hydrologic planning unit: water resources need to be assessed basin-wide and regulatory actions need to be coordinated on a watershed basis (taking into account critical resource protection and restoration needs). Water resources protection can and should be achieved through a variety of means, including pollution prevention, source controls, siting controls, land-use controls, best management practices, and land acquisition/restriction.

THE MASSACHUSETTS WATERSHED INITIATIVE[1]

BACKGROUND

The Massachusetts Watershed Initiative (MWI) was launched in 1993 at a special forum of watershed and environmental groups, businesses, municipalities, and governmental interests. This forum was the culmination of efforts among the represented interests to develop public/private partnerships on a watershed basis. Several key leaders of private watershed associations across the Commonwealth had approached the Secretary of the cabinet level Executive Office of Environmental Affairs to secure the Governor's commitment to this new approach. These citizen-based groups have a long history of watershed-based activities and saw the need for coordination and partnership. At the same time, the federal EPA was considering consolidating activities such as permitting and planning within a watershed framework and the state was exploring the watershed approach as a strategy to: 1) address nonpoint source pollution on a comprehensive watershed basis, 2) improve inter-agency coordination to maximize limited resources,

[1] From "The Massachusetts Watershed Initiative: Opportunities and Challenges in Reshaping Government." 1998 by Paula Jewell, EOEA; Mike Gildesgame, DEM; Maria Van Dusen, Riverways; Edward Himlan, Massachusetts Watershed coalition.

and 3) move toward community-based decision making through collaborative partnerships among all public and private watershed interests.

At this forum, twelve actions (all of which have been completed or begun, except for amending the Clean Water Act which requires legislative approval) were adopted to define and further the watershed approach in Massachusetts (see Table 1). As part of these actions, the Watershed Initiative Steering Committee (WISC) was established to advise the Secretary of Environmental Affairs. The WISC includes a broad array of watershed interests, including watershed organizations, regional and local "user" (e.g., angling and boating) groups. Generally, the WISC was charged with (1) developing and applying a watershed methodology to be used in a pilot project to assess conditions and plan and implement actions to improve one watershed, and (2) assisting and providing guidance regarding institutionalizing the watershed approach throughout the Commonwealth. Table 2 illustrates the goals of the MWI as articulated in WISC's 1995 Status Report on the watershed management methodology.

TABLE 1

ACTIONS IDENTIFIED AT THE 1993 WATERSHED FORUM

1. Establish a pilot project to implement the watershed approach in one or two river basins (watersheds).
2. Audit state agencies to assess watershed functions and improve inter-agency coordination within watersheds.
3. Focus the mission of the Water Resources Commission on watershed management.
4. Implement a watershed data collection and processing program.
5. Complete the identification of critical resources statewide.
6. Pass the Massachusetts River Protection Act.
7. Implement a watershed-based wetlands restoration and banking program.
8. Focus EOEA land acquisition plans on a watershed basis.
9. Establish broad-based education on watersheds and the watershed approach.
10. Governor's Task Force on Clean Water Act to examine opportunities for amending the Act to reflect watershed objectives.
11. Begin to develop a comprehensive nonpoint pollution control program.
12. Hold a second watershed management conference.

TABLE II

THE GOALS OF THE MASSACHUSETTS WATERSHED INITIATIVE

1. Realize measurable improvements in water quality.
2. Protect and restore habitats, including shellfish beds, wetlands, and fisheries.
3. Improve public access and balance multiple uses.
4. Improve local capacity to protect water resources (i.e., including all watershed interests).
5. Promote shared responsibility for watershed protection and management through aggressive outreach and education programs.

METHODOLOGY/PROGRAM DESCRIPTION

Before the Pilot Project

Several watershed-focused efforts were underway at the state and community level. The Department of Environmental Protection (DEP) was adopting a watershed approach internally by establishing small watershed teams among its staff, and using the five-year cycle as a method to integrate planning and regulatory functions. [Recently, DEP fully reorganized relevant program and staff into watershed-based units.] The Department of Environmental Management has developed river basin (watershed) planning and assessment reports since the early 1980's. The Metropolitan District Commission (MDC) has a long history of greenway planning along rivers such as the Charles and Mystic and using a watershed approach to protect drinking water supplies. The Riverways Programs in the Department of Fisheries, Wildlife and Environmental Law Enforcement (DFWELE) has used a Stream Team approach which creates citizens groups that conduct Shoreline Surveys on tributaries and segments of rivers to identify problems and take actions for improvements. Riverways has also worked statewide to support existing watershed organizations, and foster development of new groups where none existed.

Today, Massachusetts is fortunate in having an extensive network of watershed organizations throughout the state. These organizations are working in partnership with communities to protect and restore waterways and improve local stewardship of shared watershed resources. Their efforts to improve communities' management of growth and development, protect land and water resources, and establishing links between economic and environmental issues provide a vital opportunity for Massachusetts to move away from the traditional top-down environmental management.

Although all of these efforts were producing results, there was a need to develop and test a methodology to improve inter-agency coordination, create stronger public/private partnerships among community, business and government and to develop a broader, more comprehensive approach to environmental protection.

The Neponset Watershed Pilot Project

A pilot project was instituted in 1994 in the Neponset River watershed – a sub-watershed of the Boston Harbor located just south of Boston. This pilot tested three tenets of WISC's watershed management methodology: (1) the viability of inter-agency (state and federal) Basin Teams, (2) the effectiveness of collaborative partnerships among all levels of government and the private sector, including the watershed organization, Stream Teams and citizens; and (3) the extent to which a comprehensive approach to environmental protection can be accepted and implemented by all parties. An additional challenge was to carry out this approach using a cycle of activities involving outreach, monitoring, assessment, planning/implementation and evaluation (see Table 3).

These three elements were an outgrowth of watershed-focused efforts already underway at the state and community level. The five-year cycle, Basin Team and partnership concepts of the MWI provided a management framework for activities for agencies and community partners new to the watershed concept, and provided an avenue to expand efforts of those already actively working toward resource protection using the watershed approach.

The partners in the Neponset watershed project, working independently, complementarily and through collaborative efforts, realized significant environmental and programmatic achievements. These achievements included improvement to water quality, a greatly increased public awareness of their river and tributaries, purchase of key parcels of open space, and the organizational growth of the Neponset River Watershed Association (NepRWA). These successes encouraged the Secretary of Environmental Affairs and the WISC to implement the watershed approach throughout the Commonwealth. EOEA expanded Basin Teams began working through the five-year cycle in the other 26 major watersheds. EOEA launched a new $2.5 million grant program dedicated to building the capacity of watershed organizations to participate in the initiative. State and federal agencies were called on to identify and pursue ways to reorient their activities around watersheds, participate in Basin Teams and achieve results in the five-year cycle. Planning and enforcement agencies began to accept and incorporate local concerns and priorities into their activities, thus making significant progress toward community-based. decision-making.

TABLE 3

THE MASSACHUSETTS WATERSHED INITIATIVE'S FIVE YEAR CYCLE

General Summary of Yearly Activities

Year-One: Outreach

- Identifying and compiling all available information previously collected within the watershed including those related to existing water quality problems.
- Identifying information gaps and what additional information is needed and how it should be obtained.
- Conducting outreach to build stakeholder involvement, learn local concerns/issues, and begin development of priorities for action.

Year-Two: Research/Monitoring

- Fill in information gaps.
- Conduct water and habitat monitoring to address watershed concerns.
- Review and incorporate additional information obtained from watershed interests.
- Continue outreach to build a strong watershed constituency.
- Begin to conduct facility inspections to determine compliance with discharge permits.

Year-Three: Assessment

- Assess watershed conditions including current water and habitat conditions and threats.
- Determine causes and sources of impairment.
- Develop solutions to immediate problems.
- Review data together with watershed interests, identify major priorities and begin to develop grant applications.

Year-Four: Planning/Implementation

- Finalize priorities through the development of a Watershed Action Plan.
- Identify, develop and implement solutions.
- Solicit available funding and prepare grant proposals.
- Prepare plans to mitigate watershed problems.
- Issue/re-issue NPDES permits
- Issue/re-issue WMA permits
- Provide technical support.
- Include watershed interests in all facets of planning and implementation.

Year-Five: Implementation and Evaluation

- Implement action items.
- Re-evaluate basin team activities.
- Update information, make changes for next cycle.
- Continue implementation together with watershed interests.

Going Beyond the Neponset: the Need to Refine the Framework

Initial successes confirmed that the vision of the Watershed Initiative would result in more effective government, improvements to the environment, and more local input into regional/watershed decisions. The work of community partners and agencies in the Initiative was encouraging, but inconsistent. It was recognized that to reach the full potential of the MWI, it was necessary to refine the framework to address several challenges, including:

a. The Role of Basin Teams: Basin Team members were not sure of the operational procedures of Basin Teams. Community partners had no defined role on the Basin Team. In addition, participation by EOEA agencies was uneven because individuals found it difficult to complete their Team duties in addition to their regular full-time duties and Team Leaders had no real authority over Team members from other agencies.

b. Partnership conflicts: There was no forum for resolving conflicts, determining accountability and gaining interagency cooperation. Agencies participating in the initiative had different, sometimes conflicting missions and cultures. Sometimes it was unclear who was accountable for completing watershed actions. These differences frequently led to disagreements on basic issues of "what is resource protection?". This was true (1) within and between the umbrella agencies of the EOEA; (2) within and between the other state cabinets (e.g., Labor, Transportation); (3) within and between the community partners and the agencies; and (4) within and between the different federal agencies (e.g., USEPA, USGS). This challenge became especially evident when trying to set priorities. Lack of clarity, misunderstandings and conflicts let to breakdowns in the ability of the agencies to work successfully together to solve environmental problems, and to work in partnership with the communities.

c. The Role of Community Partners: It was unclear how to directly involve community partners such as watershed organizations, municipal officials and businesses in the Initiative, and how to define their roles and responsibilities as community partners. There was no structure for ensuing integration and cooperation among agencies and community partners when setting priorities or providing financial or technical resources.

d. Lack of Planning in the Five-Year Cycle: It was unclear what was expected as a result of the five-year planning cycle, and how to develop annual work plans and the comprehensive watershed action plan. There was not an annual planning process that assigned resources to the work planned.

e. Need for Science and Technology: There was inadequate or inconsistent core science and technology to support Initiative activities. Additionally, there was not a mechanism for developing standards and protocols and providing consistent technical assistance to agencies and community partners.

The EOEA, working with the WISC, envisioned that refining the framework would not only solve these operational difficulties, but also act as a catalyst in alleviating the cultural and technical challenges present in the Initiative as follows:

- The demonstration of commitment from senior levels at EOEA and in the communities would reinforce the permanence of the Initiative and help alleviate the natural resistance to change;

- Agency representatives would "buy into" a structure that they had helped create;

- Defining the framework would help clarify the community partnership, and attract stronger participation from business and municipalities;

- Better definition and stronger interest in the Initiative would help "market" the watershed concept to the public and legislators and help "mainstream" the watershed concept.

To begin working out the specifics of meeting these challenges, EOEA held a retreat in 1997 which included a broad representation of senior level agency managers, Basin Team Leaders, EOEA staff, watershed associations, and representatives of businesses and municipalities. The charge to the participants in this retreat was to reach consensus on a refined framework that would answer the challenges identified in the Neponset watershed pilot project and in the Initiative overall. Participants focused on defining the operational structure for the agencies within the parameters of

existing staff and resources. They established a process for identifying the key issues in each watershed, identifying the resources needed to address them, and established a system of accountability and responsibility that required all interested parties to implement actions (see Figure 1).

The Refined Statewide Framework

Retreat participants focused on the five major areas identified above. A summary of their results follows:

A. Retreat participants confirmed that Basin Teams and Basin Team Leaders form the basis of the state's watershed protection efforts by providing a direct watershed-specific link for community participation, by conducting monitoring and assessment to determine watershed conditions and set priorities, by ensuring compliance and enforcement, and by informing decision-making at the local level. To clarify roles, Basin Team Leadership was made a full-time EOEA position. Basin Team Leaders would be responsible for developing annual work plans, in conjunction with community partners. The Plans would identify specific tasks and the resources needed to complete them. The plans would clearly identify what resources agencies and community partners would provide to complete the specific tasks and actions.

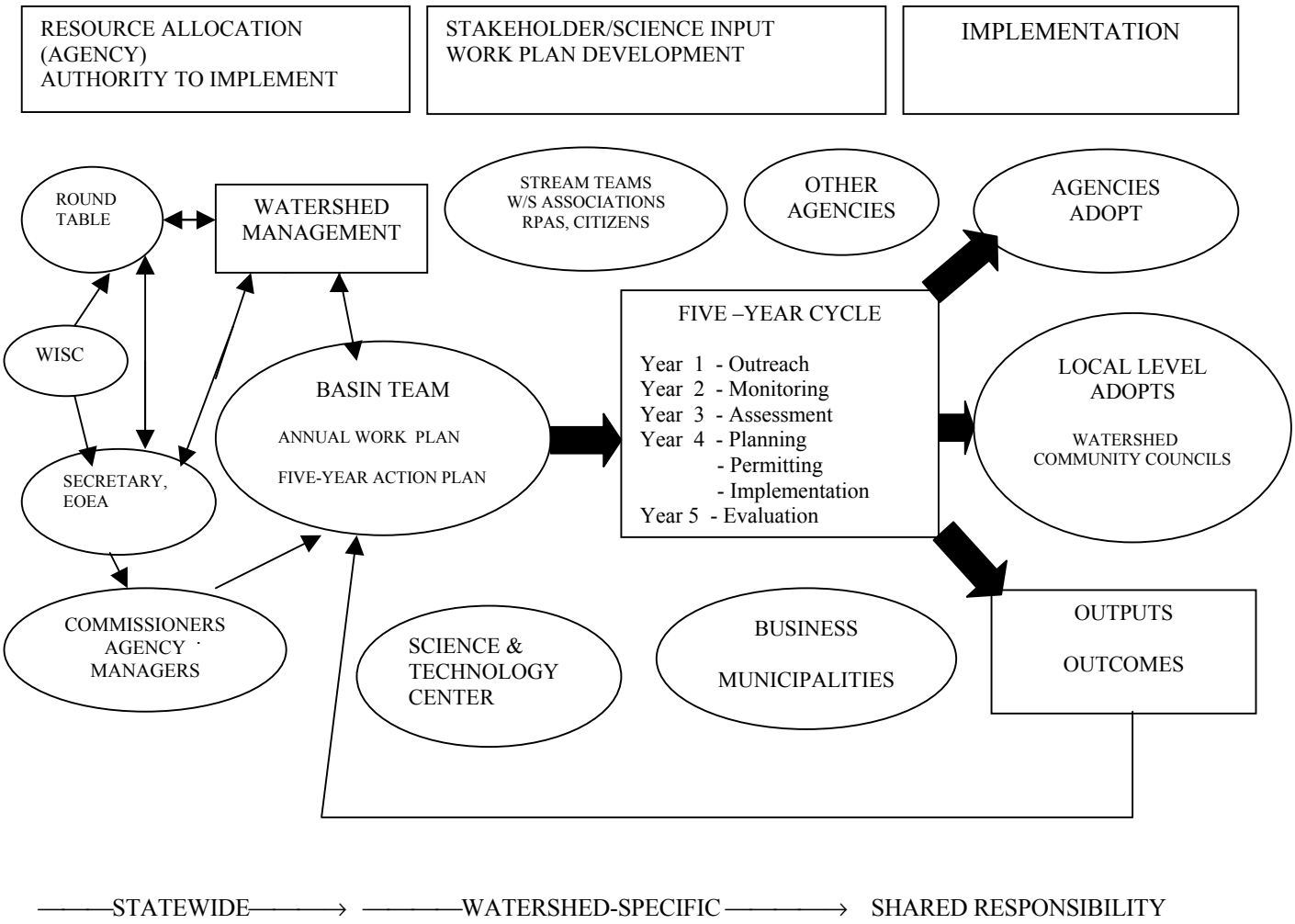
B. A Roundtable of senior level managers and community partners would be established to act as a clearinghouse and priority setting group. Roundtable members would review annual work plans and comprehensive watershed action plans (completed in the fourth year of the cycle). They would work to ensure consistency of services, while reconciling competing demands for resources. This Roundtable would resolve deadlock issues of resource allocation and ensure that subsequent decisions facilitate implementation of work plans. The WISC would have three seats on the Roundtable and ensure that community partners contribute to development and implementation of the work plans.

C. The framework identifies several key points for consistent community participation and input. It was agreed that community partners could be members of Basin Teams and Stream Teams and would take major responsibility for establishing Watershed Community Councils (broadly representative committees of stake holders to lead development and implementation of watershed action plans). Community partners could act as co-leaders with the Basin Team Leader, and would be central in setting priorities and developing and implementing plans (including commitment of their own resources and volunteer capacities). The WISC would continue to advise the Secretary and participate in the Roundtable.

D. Basin Teams, including community partner members, would write both the annual work plan and comprehensive Five-Year Watershed Action Plan. The annual work plan would include a requested resource allocation from agencies and community partners to complete the tasks identified. The Roundtable, which would include the community partners, would help refine and delineate the requests identified in each Basin Team's annual work plan, and make a recommendation to the Secretary for final approval. The comprehensive Watershed Action Plan would create the overarching long-term plan to protect and restore the watershed. It would work in conjunction with the annual work plan process which would provide the detail of what would be undertaken by whom and how during each year.

E. To make sound environmental decisions, a Science & Technology Center would be developed. The Center would provide practical, accessible data from agencies and volunteer monitors working in the watersheds. Private consultants and academicians have expressed interests which would share data and coordinate technical services.

FIGURE 1



Several work groups were assigned the task of further defining the framework to ensure a smooth transition to, and implementation of, its elements.

Retreat participants were called together again to finalize these strategies and address the Science & Technology Center concept in more detail. The Secretary of Environmental Affairs applauded the work of the retreat participants and work groups, and enthusiastically supported moving ahead with institutionalizing the refined framework statewide and more fully defining how the Science & Technology Center would provide technical services as a public/private partnership.

RESULTS

Over the course of the last five years, the Commonwealth of Massachusetts and a broad array of community partners have worked toward realizing a new vision of resource and watershed protection throughout the state. This has been an extraordinary evolution. A methodology was established and tested through the Neponset watershed pilot project. After evaluating lessons learned, several changes were made and next steps taken, including expanding Basin Teams to include a broad array of agencies (federal and state) and community partners, and developing the MWI grant program.

However, Basin Teams were achieving uneven levels of success at inter-agency coordination, working in partnership with the community level, and achieving environmental and programmatic results in the five-year cycle. To accelerate these achievements and overcome cultural resistance, the framework was refined to maximize the efficient use of limited state and federal resources, integrate community partners and emphasize comprehensive watershed-based planning.

As of 1999, twenty individuals have been chosen from several state agencies to assume EOEA positions as Basin Team Leaders. Nearly $1.5 million in grants has been awarded to watershed associations and other key players. Criteria for other grants and loans and the state's permitting and planning processes now include watershed parameters. Agencies continue to develop additional ways of incorporating the watershed approach into their programs, and the state is working toward integrating other programs, such as growth planning, toward a broad vision of integrated environmental management. Figure 2 depicts the milestone schedule for the state's 27 basins based upon a repeating five-year cycle.

Achieving the full potential of the MWI depends on the presence of effective, credible watershed organizations in every watershed. Watershed organizations presently range from fully staffed groups with professional programs to all-volunteer groups with limited resources. These groups are developing their capacity to participate in the Initiative and be more active and influential in local decision-making. The Massachusetts Watershed Coalition and the Riverways Programs are providing a variety of capacity building assistance programs to help them develop their organizations and their programs.

DISCUSSION

Refining the framework for watershed protection and increasing the capacity of watershed groups around the state will certainly allow Initiative participants to better manage and protect the environment, and begins to resolve some of the cultural challenges. However, as Basin Teams and community partners test their newly forming unions, new challenges have emerged:

- The watershed concept, and the need for thinking about issues upstream and downstream, is still not part of the mainstream environmental message heard by the general public and local officials.

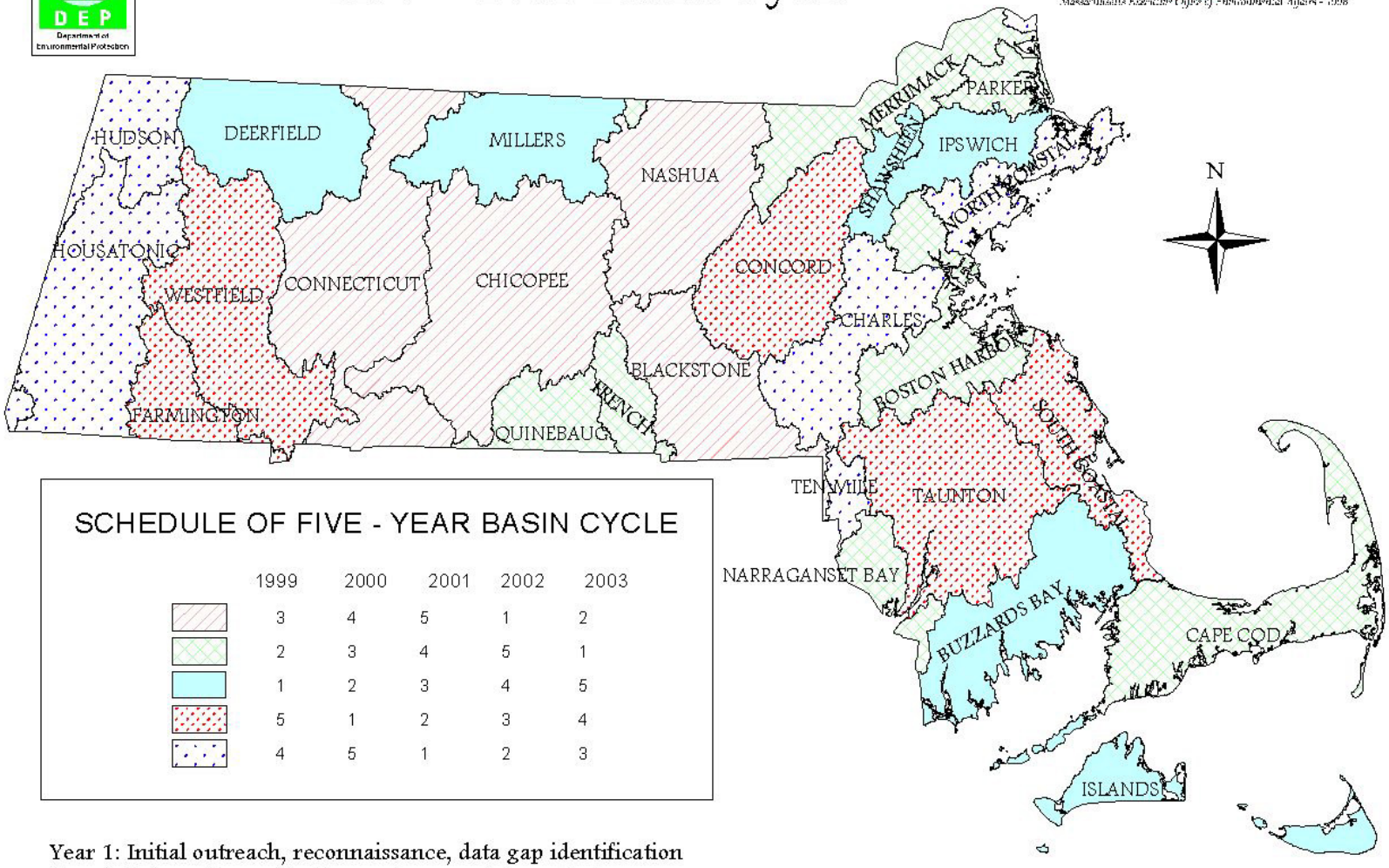
- There is still some hesitation among agency representatives, municipal officials and businesses to fully embrace community-based decision making. This is partially due to a traditional "us versus them" attitude between government and non-government entities. Potential participants also hesitate because they are concerned that participating in a partnership will erode their own program's identity and integrity and are unsure about how far citizen empowerment can and should proceed. This issue is complicated by the fact that municipal and watershed boundaries do not always coincide.

- There are continual challenges in bringing together entities with different missions and goals. This issue will be somewhat resolved by the enhanced authority of the Basin Team Leader, through training Basin Teams, including community partners, to understand the differing missions of the agencies and to work as a Team toward consensus-building and team-building skills to improve interactions among the wider array of MWI participants.

- Each participant in the Initiative has distinct perspectives and perceptions of activities and decisions. This has become especially evident during partnership-based priority setting efforts when participants may focus on their "positions," rather than the long-term watershed-wide "interest."

- Working together with entities that may have been traditionally on the "other side" of issues presents a unique challenge. It is tempting for participants to call forward past frustrations in this new forum. However, the MWI was not conceived to answer errors of the past and cannot resolve frustrations beyond its framework.

Massachusetts Watershed Initiative
Five - Year Basin Cycle



SCHEDULE OF FIVE - YEAR BASIN CYCLE

	1999	2000	2001	2002	2003
	3	4	5	1	2
	2	3	4	5	1
	1	2	3	4	5
	5	1	2	3	4
	4	5	1	2	3

Year 1: Initial outreach, reconnaissance, data gap identification
Year 2: Information gathering, environmental monitoring
Year 3: Assessment of information/data
Year 4: Planning and implementation
Year 5: Evaluation

- The Basin Team has been an excellent forum for productive discussion of differing perspectives on watershed issues. However, translating discussion into actions has been uneven because there is an unclear mechanism for decision-makers to fully utilize the Basin Team's conclusions.

Successful resolution of these challenges is especially important to forging true partnerships between the agencies and community partners. Some of the ways that EOEA and community partners are working to meet some of these challenges include:

- Working with the WISC to develop and package a stronger public outreach component.

- Seeking ways to clearly articulate the framework and purpose of the MWI.

- Watershed associations and Basin Teams working with individual municipalities and businesses to define how they can participate in the Initiative.

- Working with agency staff to better coordinate planning and permitting activities and more clearly link Basin Team activities with decision-making processes.

- Helping project applicants or proponents to deal with all agency issues at the front end of projects and reducing the "surprise" requirements that may occur mid-way in a project and cause frustration, delay, and confusion.

- Launching a new training program for Basin Team Leaders, Teams and community partners emphasizing communication, Team-building, consensus-building and positive conflict resolution.

- Expanding support to efforts to build the capacity and partnering ability of the state's watershed organizations.

CONCLUSION

The Massachusetts Watershed Initiative has made tremendous strides in fostering community-based decision-making, establishing collaborative partnerships, and facilitating cooperation among agencies in a watershed framework. The use of inter-agency Basin Teams has improved our ability to utilize multi-disciplinary, multi-media strategies and solutions for environmental problems. Local stewardship has flourished through Stream Teams, increased local government and private participation, and enhanced public awareness of rivers and watersheds. Watershed organizations are a strong and well-represented force which help "glue" collaborative partnerships among the communities, business and government. These improvements have fostered development of comprehensive solutions to nonpoint source pollution, wetlands encroachment and other watershed-wide issues.

The repeating five-year cycle may be viewed as a feedback loop, based on monitoring and public outreach, to assess the effectiveness of nonpoint source pollution strategies. Their exists a continuing cycle of opportunities to revise activities as necessary in order to achieve and maintain beneficial uses of water.

However, there remain challenges ahead in retaining the integrity of existing partnerships and fostering development of new partnerships watershed-by-watershed which require that the Initiative continues to evolve toward an increasingly cooperative ethic which emphasizes:

- An increasingly broad audience of watershed interest;
- collaborative priority setting and shared responsibility for achieving watershed actions;
- consensus-based processes and frameworks;
- continued growth in community-based decision making;
- a balance between locally defined plans and actions.

With the refined framework in place and a strong commitment to continued growth and improvement of the Initiative, EOEA and the WISC look forward to answering these challenges in the next five years, and achieving our goals of

improved community stewardship and strong partnerships which prevent problems, leverage each communities' resources, and restores and improves local waterways and our watersheds.

INTEGRATION OF MANDATORY PROGRAM ELEMENTS

The accompanying flow chart (Table 4) indicates the general sequence of events which integrates the requirements of Section 305(b) [Summary of Water Quality], 303(d) [List of Impaired Waters] and TMDL [Development of Total Maximum Daily Loads] process into the Watershed Initiative. In addition, extensive input from communities and local partners are part of the watershed planning process.

During the first two years of the Watershed Initiative all sources of information are identified and data is collected where necessary to fill information gaps. That information is then used to develop water quality and habitat assessments for each watershed during Year 3 of the cycle. Although the Department of Environmental Protection (DEP) is responsible for developing water quality assessments to meet federal requirements, the assessments are in the process of being expanded to include other watershed parameters, such as habitat and land-use assessments. In addition, watershed teams and other agencies are asked to provide comment on assessments when they are in draft form. The water quality assessments are then used to develop and update the 305(b) report that is submitted to EPA bi-annually.

The water quality assessments conducted during Year 3 of the cycle are also used to identify waters which should be included (or removed) from the state list of impaired waters based upon new data and information collected during the previous year. The 303(d) list identifies waterbodies in need of further clean-up and the watershed team is used as the primary vehicle to help prioritize those waters for TMDL development. The TMDL process provides the mechanism for allocating allowable pollutant loads between point and nonpoint sources. In this way the DEP and the watershed teams receive continual input on the development of both the 303(d) list and priority waters for TMDL development.

As previously stated, the TMDLs for any watershed will be prioritized through the watershed teams. As TMDLs are developed they will be incorporated into the Watershed Action Plan that will be developed during Year 4 of the cycle. The close working relationship of basin teams and stream teams in each watershed offers high potential for successful implementation on a priority basis.

The funding mechanisms for TMDL implementation, as well as other watershed priorities, will vary from watershed to watershed and from project to project. DEP, however, has revised its regulations to provide more priority points for SRF funding and for grant funding under the 319, 104(b)3 and 604(b) funding programs where the project addresses issues identified in the Watershed Action Plan. As such, funding priority is given to those projects identified as team priorities.

In many cases, however, it is expected that local action and funding sources will be used to implement TMDLs. In other cases regulatory action or simply changes in the traditional way of "doing business" may be all that is required to effect implementation of best management practices.

The final phase in the Five-Year Cycle is the continued implementation and evaluation of the watershed action plan and TMDLs. This may include re-assessing priorities and/or simply project tracking to determine success or failure of any implementation strategy. This Five-Year Cycle approach has been formally incorporated into the federal (EPA Region 1) and state (DEP) Performance Partnership Agreement.

TABLE 4

GENERAL SEQUENCE OF ACTIVITIES

PROCESS	ACTION	WATERSHED CYCLE	PUBLIC/AGENCY REVIEW-COMMENT
Watershed Outreach	Outreach; Public Input; Identify Data Gaps	Year 1	Yes, informal
Watershed Monitoring	Info gathered; water quality monitored	Year 2	Yes Informal – Watershed team priorities included in monitoring plan where appropriate
Watershed Assessment of Data/Info	Date/info collected during Year 1 & 2 are assessed and water quality assessment report generated	Year 3	Yes, Teams and agencies requested to review Water Quality Assessment in draft form. This information is then used to produce both the 305(b) report and 303(d) list
305(b) Report	State-wide assessment of water quality	Prepared in Year 3	Yes, Formal - Teams & agencies asked to provide input into 305(b) report which is produced every two years
303(d) List	Impaired/threatened waterbodies	On-going	Yes, Formal – Teams asked to comment & provide input into development of the 303(d) list.
TMDL	Prioritized by basin	Those basins in Year 3 and 4 or other priority waterbodies	Yes, Formal – Teams asked to comment on draft TMDLs, to incorporate completed TMDLs into the watershed action plan & to help in Implementing corrective actions
Implementation	Grants developed and targeted; Watershed Action Plan developed, Local assistance sought to resolve nonpoint problems, Implementation includes voluntary actions, funding, permitting, and enforcement where necessary	Year 4, implemented by Watershed Teams	Yes, formal actions
Evaluation	Feed Back; Project Tracking; Monitoring	Year 5	Yes, Informal

SUMMARY

The **Massachusetts Watershed Initiative** is both a structure and process for implementing the watershed approach. The methodology is intended to be a dynamic framework which can be adapted to meet the unique opportunities and conditions in each watershed.

The key features of the Watershed Management Methodology, essential for successful implementation of the watershed approach, are:

- The co-leadership roles of the state, watershed associations or other citizen groups, the business community, and municipalities in implementing the watershed approach;
- Twenty-seven interdisciplinary watershed teams who are managed by 20 full-time team leaders;
- Community-based outreach, resource assessment, planning and implementation involving all stakeholders;
- the sub-watershed focus of problem identification and Watershed Action Plan development;
- The goal of targeting allocation of limited dollars to watershed priorities, so they are used where we can achieve the most environmental protection for the dollar available;
- The state will not pick priority watersheds – we will not pick winners and losers. The key to effectively protecting our environment and to a watershed approach is local action and empowering local people to protect their local resources. This type of empowerment is happening in all our watersheds.
- Integrating local, state and federal environmental programs on a watershed basis, using the watershed workplans as the vehicle for integrating specific activities in a specific year.

Annual Work Plans are developed by each watershed team and serve as a guide for coordinating team work efforts of a given year. They are the building blocks of the Five-Year Watershed Action Plan and provide the basis of resource requests to the Roundtable.

Each annual work plan is organized by the Watershed Initiative's goals (outreach and education, local capacity building, water quality, water quantity, habitat, open space and recreation). The work plan lists tasks for team members (both agency and non-agency), identifies the cost of implementation (e.g., funding, personnel costs/time commitment), and contains a proposed schedule of activities for the period of the work plan. The Annual Work Plans are to be the basis of regulatory decision making.

To ensure accountability for agencies and community partners, the annual work plans include a Partnership Agreement signed by agency commissioners and other partners identified as having responsibility for completing actions identified in the plan. All partners accept responsibility through annual work plans.

Five Year Watershed Action Plans serve as working guidance documents that outline strategies to mitigate watershed problems and protect resources. Each of the partners in the watershed process bring their action items to the plan. The Watershed Action Plans provide the framework for cooperative efforts to protect and restore the natural resources of the watershed. They describe and prioritize environmental problems in the watershed, identify alternative technologies, specify structural and non-structural solutions, describe sources of funding and technical assistance, make recommendations for regulatory decisions and specify a funding plan and schedule for completing actions. Most importantly, Watershed Action Plans assign roles and responsibilities for implementing the actions among the various stakeholders, within and outside the watershed, and designate lead persons or organizations. The Five-year Watershed Action Plan forms the basis of regulatory decision making. The plans are submitted to federal, state, and local agencies to guide their decision making and allocation of funds and technical assistance.

EC:DJM
Volume 2-1999